

Canister cleaning equipment surpasses expectations

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Last month, Hanford's Spent Nuclear Fuel Project began operating equipment to clean the empty canisters that previously held irradiated uranium fuel assemblies in the K West Basin. Early processing rates for the new machinery far surpassed predictions, with 25 canisters and 23 canister lids cleaned during the first week of operation.

The canister cleaning activity is very important, according to Fluor Hanford project manager Mike Cahill. "It's part of the total picture of SNF Project commitments," Cahill explained. "If we can't get the cans clean enough to remove them, then we won't meet the end date for K West Basin cleanout. The can cleaner may not seem as momentous as some other project components, but it's still very important. All activities must interface for overall success."

The canisters have been contaminated by contact with the fuel and basin water, and must be cleaned to reduce radiation levels enough that they can be safely handled and transported. There are approximately 3,800 canisters in the K West Basin, and approximately 3,700 more will be brought in as fuel is transferred from the K East Basin beginning in late November 2002.



From left, nuclear chemical operator Phil Hawkey (back to camera), supervisor Bob Banks, K W Project manager Tom Orgill, NCO Rich Merker, NCO Lori Johnson and physics technician Colleen Tinney oversee initial canister cleaning operations in K W Basin.

All of these contaminated canisters will need to be removed in order to facilitate removal of the approximately 200 large racks in the K West Basin. Additionally, canister removal will allow for removal of the sludge that lies under and around the canisters and racks.

Each canister consists of two 8-inch-diameter steel or aluminum "barrels" joined by an upper and a lower welded trunnion (bridging link). A full canister holds 14 N Reactor fuel assemblies, or seven assemblies in each barrel. Canisters and racks have to be cleaned to an acceptable level for safe disposal, and to a level that minimizes exposure of workers to radioactivity.

Headed for ERDF

Final destination for the canisters and racks after cleaning is the Environmental Restoration Disposal Facility. A record of decision bringing K Basins cleanout under the Comprehensive Environmental Response, Compensation and Liability Act, or CERCLA, was signed in September 1999. At that time, the Department of Energy Richland Operations Office, the U.S. Environmental Protection Agency and the Washington State Department of Ecology agreed that K Basins debris would be eligible for disposal in the ERDF if it met acceptance criteria and after some additional implementing agreements were negotiated.

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The K West Basin cleaning system contains a high-pressure washing and packaging system with parts located both in and out of the basin water. It consists of a pump skid located outside a “greenhouse” enclosure made of steel and a plastic-like substance called Lexan, and a cleaning table below the water surface in the basin’s technical viewing pit area.

The cleaning table is nearly 20 feet long, with guides or tracks to hold the canisters in place and a hoist for moving them onto the table. The containment enclosure, equipped with a HEPA (high-efficiency particulate air) filter, is used to remove cleaned canisters from the basin.

The washing system cleans both the insides and outsides of the canisters. Once cleaned, each canister is surveyed, verified to be below acceptable radiation levels and then bagged and removed to a disposal container. All canisters, along with floor racks, must be removed from the K Basins by Jan. 31, 2005.

Unique design

The design for the enclosure and canister hoist is unique, although the high-pressure water jet is based on standard technology. Canister cleaning system design, construction, installation and operations are just one additional challenge in the complex and unique process of dealing with DOE’s largest collection of defense spent nuclear fuel.

“We’re glad to have the can cleaner system operating and even exceeding throughput predictions,” said Bob Heck, Fluor Hanford vice president for the SNF Project. “All of these steps and successes help us reach the DOE-RL goal of consolidating Hanford’s major nuclear hazards in the central plateau.” ■